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<p>(21) International Application Number: PCT/GB98/01636</p> <p>(22) International Filing Date: 19 June 1998 (19.06.98)</p> <p>(30) Priority Data: 9713077.7 21 June 1997 (21.06.97) GB</p> <p>(71) Applicant (for all designated States except US): OWEN MUMFORD LIMITED [GB/GB]; Brook Hill, Woodstock, Oxford OX20 1TU (GB).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): MARSHALL, Jeremy [GB/GB]; 16 Cranham Street, Jerico, Oxford OX2 6DD (GB). DAVISON, Glenn [GB/GB]; 44 Grimsbury Square, Banbury, Oxon OX16 7HP (GB). MUMFORD, Adam, John [GB/GB]; 76 Langdale Gate, Witney, Oxford OX8 6EY (GB).</p> <p>(74) Agents: LAINE, Simon, James et al.; Wynne-Jones, Laine &amp; James, 22 Rodney Road, Cheltenham, Gloucestershire GL50 1JJ (GB).</p>		<p>(81) Designated States: AU, JP, KR, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p><b>Published</b> <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>
<p>(54) Title: IMPROVEMENTS RELATING TO SKIN PRICKERS</p> <div data-bbox="326 1115 1243 1507"></div> <p>(57) Abstract</p> <p>After removal of a protective cap, the forward end of a barrel (1) of a skin pricker is placed against the skin and the user presses the projecting end of a trigger (6) forwards. As the trigger pivots about a fulcrum (9) of the barrel (1), a thin bridge onto a lancet (2) shears. The lancet is released, and shoots forward as a spring (3) extends, thus projecting a needle tip (4) to prick the skin. This projection is only momentary and the lancet (2), which is captive to the spring (3), is pulled back as the spring (3) reverts to a recovery position where the needle tip is safe inside the barrel. The trigger (6), although broken away from the lancet, remains captive to the barrel by the enlargement (11). The lancet cannot again be operated to eject the needle and the pricker is then intended to be discarded.</p>		

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Improvements relating to Skin Prickers

This invention relates to skin prickers for drawing small drops of blood for analysis. These have been developed so that they are cheap enough not only for the lancet  
5 whose tip penetrates skin to be thrown away after a single use, but also for the whole device which contains and fires the lancet to be discarded. Such wastage is justifiable in that it eliminates the risk of infection, sometimes fatal, from used lancets.

10 These throw-away devices automatically retract the lancet after the tip has momentarily projected, and they are designed so that it is virtually impossible to get at the lancet after such use. However, such an objective is not always achieved, and by using a tool, for example, it is  
15 sometimes possible to reset the lancet.

Another problem facing the designer of such a device is to make it as simple as possible, with the minimum number of parts to manufacture and assemble. If the device is to be thrown away after a single use, anything too complex is  
20 costly and unacceptable.

It is the aim of this invention to provide a skin pricker which is a "throwaway" after a single use, which is of very simple construction, and which, short of destruction, does make it virtually impossible to have access to  
25 the lancet after use.

In our International Patent Application No. PCT/GB98/01237 we have proposed a skin pricking device which should fulfil these requirements. It comprises a barrel

containing a spring loaded lancet releasable from a primed rearward position momentarily to project its tip from the forward end of the barrel and then retract it, wherein the priming and release means for the lancet are combined in an element projecting laterally from the lancet through a longitudinal slot in the barrel, the element having a weakness enabling it to be broken off having been shifted to a catch formation retaining it at the rear end of the slot, the breaking off releasing the lancet.

10 We now have a further proposal, making the device even simpler to use by eliminating the priming step.

According to the present invention there is provided a skin pricker comprising a lancet spring loaded in such a manner as to be releasable from a primed rearward position so as momentarily to project its tip from the forward end of the barrel and then retract it, wherein the lancet is formed integrally with a trigger that projects outwardly through an aperture in the forward end of the barrel, there being a shearable bridge within the barrel between the trigger and  
20 the lancet, and wherein, in manufacture, the barrel is closed around the lancet to form the aperture and capture the trigger, which keeps the spring means primed, actuation of the trigger shearing the bridge and releasing the lancet.

Preferably, the aperture and trigger are so formed  
25 that, after shearing away from the lancet, the trigger remains captive to the barrel.

Conveniently, the trigger is designed to be actuated so as to pivot its externally projecting end towards the

forward end of the barrel. The wall of the aperture on which the trigger bears provides a fulcrum and the leverage that is thereby achieved makes shearing of the bridge (which will be very close to the fulcrum) quite easy.

5        Preferably, the lancet tip is shielded by a cap which has an exposed end forward of the barrel. When the user is ready, this can be twisted off, shearing a narrow neck at the root of the needle tip. The cap maintains the sterility of the needle before use and it provides a guard should the  
10 trigger be accidentally sheared off and the lancet fired.

Conveniently, the barrel is made in two generally semi-cylindrical halves, which may be integrally moulded, and which are folded together to join in a diametral plane.

Advantageously the barrel may incorporate at least one  
15 internal longitudinal channel in which projecting portions on the lancet can slide, but which prevents rotational movement of the lancet.

For a better understanding of the invention, one embodiment will now be described, by way of example, with  
20 reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a skin pricker of this invention before use;

Figure 2 is a perspective view of the pricker of Figure 1 before use with half its barrel removed;

25        Figure 3 is a perspective view of the pricker as in Figure 2 but at the point of use;

Figure 4 is a perspective view of the pricker as in Figure 2 but after use; and

Figure 5 is a perspective view of two parts of the barrel of an alternative form of skin pricker of this invention in an open state during assembly.

The pricker of Figures 1 to 4 has a two part barrel 1, the two parts 1A, 1B being generally semi-cylindrical. It houses a lancet 2 and a coil spring 3, the needle tip 4 of the lancet being initially shielded by an elongate cap 5 that projects through an aperture 12 at the forward end of the barrel 1.

The plastics body of the lancet 2 has a trigger 6 integrally moulded at its rear end. This trigger extends generally radially through an aperture 7 formed when two cut-outs formed in the parts 1A, 1B of the barrel come together. The trigger is joined to the lancet body by a thin bridge 8. The forward side of the body of the barrel forming the aperture 7 provides a fulcrum 9 about which the trigger can be pivoted. The trigger has a waist 10, whilst the inner end 11 of the trigger is enlarged and incapable of passing through the aperture 7.

The pricker is assembled with its components as shown in Figure 2, that is with the spring 3 compressed and the lancet 2 retracted.

For use, the cap 5 is twisted off in known manner. The lancet is held against rotation by virtue of the fact that the trigger 6 is captive in the aperture 7. The forward end of the barrel with the aperture 12 is placed against the skin and the user presses the projecting end of the trigger 6 forwards. As the trigger pivots about the fulcrum 9 the

thin bridge 10 shears. The lancet is released, and shoots forward to the Figure 3 position as the spring 3 extends, thus projecting the needle tip into the skin. This projection is only momentary and the lancet 2, which is captive to the spring 3, is pulled back to the Figure 4 position, as the spring reverts to a recovery position, where the needle tip is safe inside the barrel. The trigger 6, although broken away from the lancet, remains captive to the barrel by the enlargement 11.

10 In the device shown in Figure 5, similar parts to those of the embodiment of Figures 1 to 4 are given the same reference numbers. The two parts of the barrel 1A and 1B are integrally moulded to form a connecting hinge 13 and incorporate channels 14 within which projections 15 on the  
15 lancet 2 can slide. These ensure that the lancet does not rotate as the cap 5 is unscrewed which could result in premature firing of the needle if the thin bridge 8 was to be sheared. Once the pricker is assembled operation by pressing the projecting end of the trigger 6 towards the  
20 forward end of the barrel 1 is much the same as for the device of Figures 1 to 4.

CLAIMS

1. A skin pricker comprising a lancet spring loaded in such a manner as to be releasable from a primed rearward position so as momentarily to project its tip from the forward end of the barrel and then retract it, wherein the  
5 lancet is formed integrally with a trigger that projects outwardly through an aperture in the forward end of the barrel, there being a shearable bridge within the barrel between the trigger and the lancet, and wherein, in manufac-  
10 ture, the barrel is closed around the lancet to form the aperture and capture the trigger, which keeps the spring means primed, actuation of the trigger shearing the bridge and releasing the lancet.

2. A skin pricker according to Claim 1, wherein the  
15 aperture and trigger are so formed that, after shearing away from the lancet, the trigger remains captive to the barrel.

3. A skin pricker according to Claim 1 or Claim 2, wherein the trigger is designed to be actuated so as to pivot its externally projecting end towards the forward end  
20 of the barrel.

4. A skin pricker according to any one of Claims 1 to 3, wherein the wall of the aperture on which the trigger bears provides a fulcrum and the leverage that is thereby achieved facilitates shearing of the bridge.

25 5. A skin pricker according to any one of Claims 1 to 4, wherein the lancet tip is shielded by a cap which has an



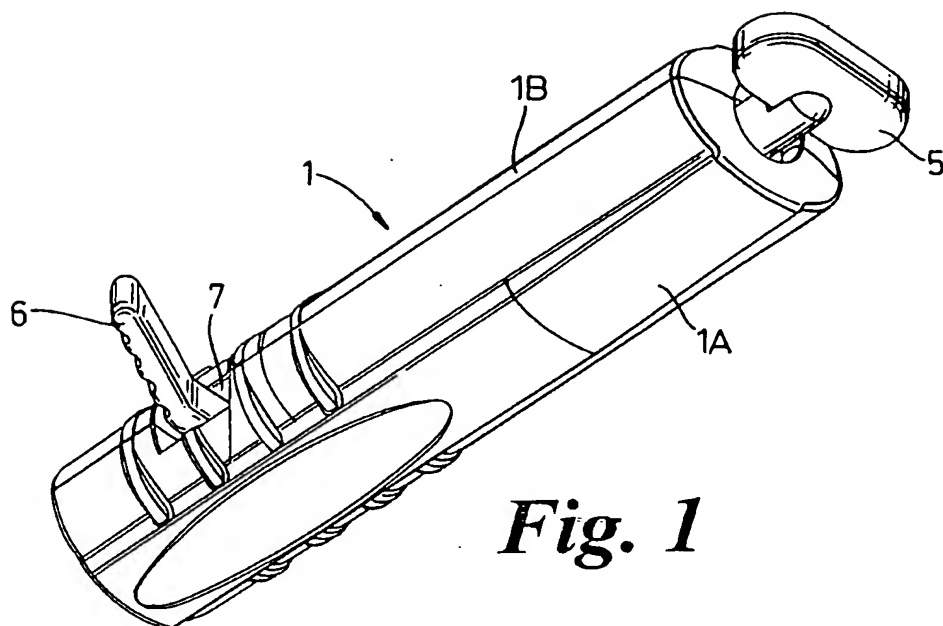
exposed end forward of the barrel.

6. A skin pricker according to any one of Claims 1 to 5, wherein the barrel is made in two generally semi-cylindrical halves, which may be integrally moulded, and which are folded together to join in a diametral plane.

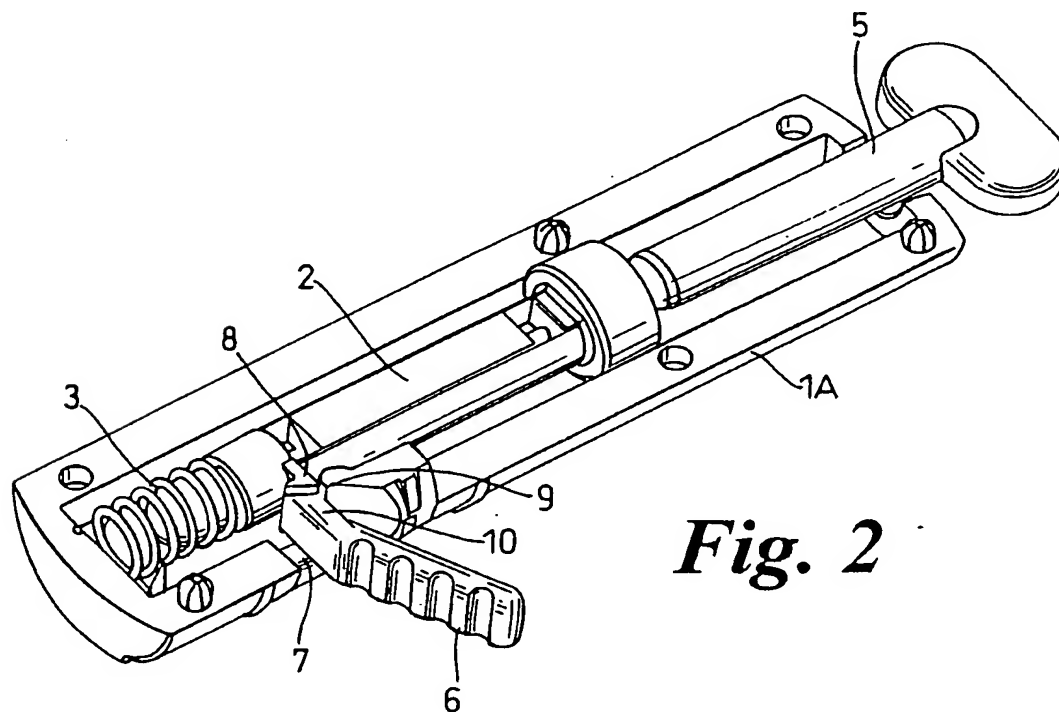
7. A skin pricker according to any one of Claims 1 to 6, wherein the barrel incorporates at least one internal longitudinal channel in which projecting portions on the lancet can slide, but which prevents rotational movement of the lancet.

8. A skin pricker substantially as herein described with reference to the accompanying drawings.

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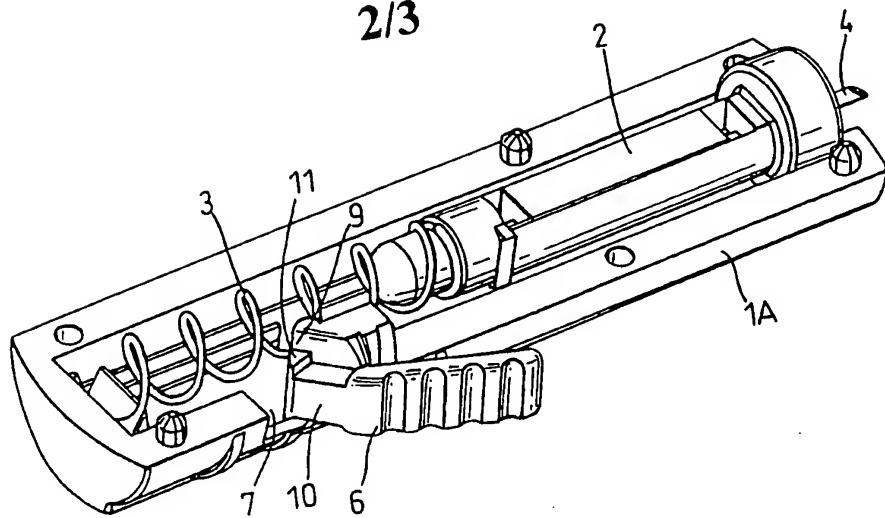


*Fig. 1*

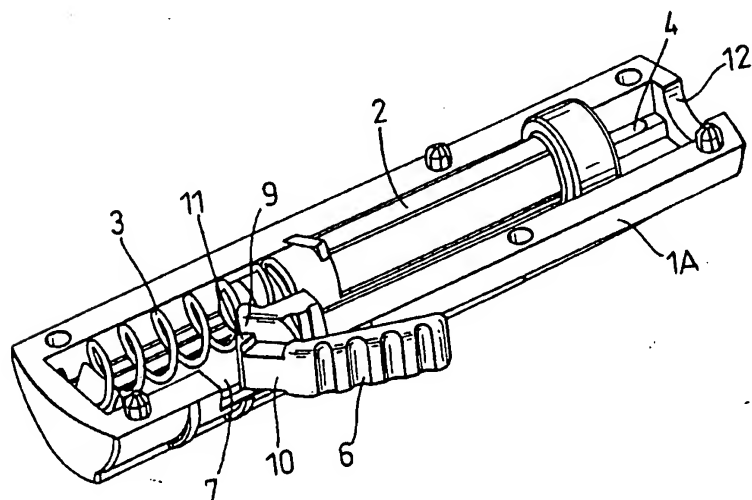


*Fig. 2*

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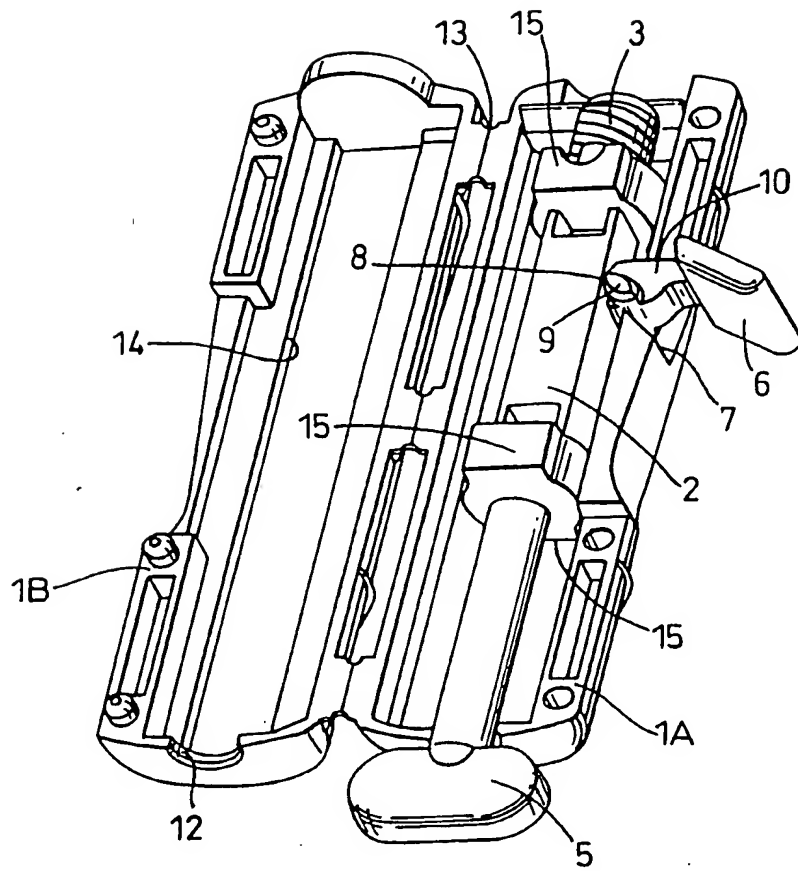


**Fig. 3**



**Fig. 4**

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**Fig. 5**

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/01636

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61B5/14

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61B A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 427 406 A ( OWEN MUMFORD LIMITED ) 15 May 1991 see column 1, line 22 - column 2, line 30 see column 4, line 23 - line 37 ----	1, 3, 5-8
A	WO 93 19671 A ( OWEN MUMFORD LIMITED ) 14 October 1993 see page 1, line 22 - page 3, line 8 see page 6, line 2 - line 21 ----	1, 5-8
A	GB 2 294 641 A ( OWEN MUMFORD LIMITED ) 8 May 1996 see abstract -----	1, 5, 7, 8

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
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Information on patent family members

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